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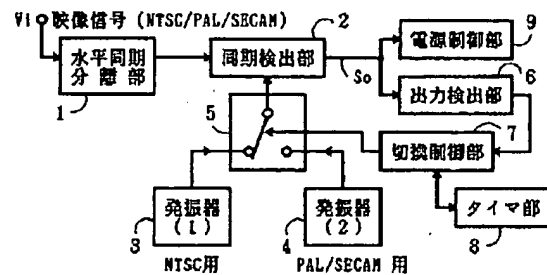
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(54)【発明の名称】 同期検出回路

(57)【要約】

【課題】 NTSC、PAL及びSECAM方式の映像信号が入力されるPDP搭載のモニタ装置等において、前記各方式ごとの同期信号の有無を検出する。

【解決手段】 前記各方式の映像信号Viは水平同期分離部1に入力し、水平同期信号が分離される。同分離された水平同期信号は同期検出部2に入力する。この同期検出部2は、水平同期信号の周波数と発振器出力周波数とが同じ場合には同期状態にあることを示す信号を出力する。出力検出部6は同期検出部2から出力される上記同期状態にあることを示す信号を検出する。この検出があったときには切換制御部7は切換回路を現位置に維持し、検出されないときには現位置から他方の発振器側へ切り換える。この切り換えにより、同期検出部2は同期状態になれば上記同様の信号を出力し、非同期であれば映像無入力状態を示す信号を出力する。これにより、入力映像信号の有無が検出される。



**\* NOTICES \***

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]**

[0001]

**[Field of the Invention]** This invention relates to a synchronous detector and relates to detection of the existence of the synchronizing signal for said every all directions type in the monitoring device of PDP (plasma display panel) loading which made each video signal of NTSC system, a PAL system, and an SECAM system applicable to an input at the detail etc. more.

[0002]

**[Description of the Prior Art]** Although PDP has the advantage being a thin shape and in which it is lightweight, compared with the conventional Braun tube, the actual condition is consuming the Braun tube, an EQC, or more than it in the point of power consumption. For the reason, the measures against the ephemeralization of the life of PDP by generation of heat are required. Moreover, in PDP, also when there is no image input (inputting [ no ]), PDP has shone under a certain brightness and consumes useless power. It is because the preparations for performing discharge called addressing are made to have shone under the brightness which exists also at the time of no inputting [ this ]. When it puts in another way, it is for changing into the standby condition of luminescence in preparation for the time of an image input. On the other hand, since it is generally cut off (dark condition) when there is no image input in the case of the Braun tube, power consumption decreases. For the reason, it is desirable to turn OFF (standby condition) the power source of this equipment in the monitoring device of PDP loading at the time of no image inputting in respect of reservation of a life.

[0003] Moreover, the video signal of various kinds of methods, such as NTSC system, a PAL system, and an SECAM system, is inputted into a monitoring device. Therefore, even if it is the video signal of which the above-mentioned method, when the existence of an image input is

detected correctly and this image input cannot be found, the function to turn off the power source of equipment is required. Although it becomes simple [ the configuration of the detector itself ] when the existence of this image input is detected only by the existence of a signal, noises, such as pulse nature, are taken and possibility of causing malfunction arises. Therefore, the circuit of a configuration of being conventionally shown in drawing 2 was used. Hereafter, it explains per this drawing.

[0004] Drawing 2 targets the video signal of NTSC system, a PAL system, and an SECAM system as an image input Vi. The horizontal synchronization separation section into which 11 separates a Horizontal Synchronizing signal from a video signal, the 1st synchronous detecting element for NTSC system video signals in 12, The 1st oscillator which oscillates the signal of the frequency as the Horizontal Synchronizing signal frequency (15.734 KHz) of this NTSC system video signal with 13 [ same ], The 2nd oscillator with 14 [ common to the video signals of a PAL system and an SECAM system ] and 15 are the 2nd oscillator which oscillates the signal of the same frequency as the horizontal movement synchronizing signal frequency (both methods 15.625 KHz) of this PAL-system and SECAM system each video signal. In addition, generally the 1st oscillator 13 and 2nd oscillator 15 use a crystal oscillator. When the image input Vi is the video signal of NTSC system, a Horizontal Synchronizing signal is separated in the horizontal synchronization separation section 11, and it is sent to each synchronous detecting elements 12 and 14. The signal which will be in a lock condition in the 1st synchronous detecting element 12 since the Horizontal Synchronizing signal from the horizontal synchronization separation section 11 and the oscillation output from the 1st oscillator 13 are these frequencies, and shows the lock condition (for example, "high (H)" is outputted.) On the other hand, it becomes "low (L)" in the condition of not locking. The synchronous detecting elements 12 and 14 are constituted from a PLL circuit (phase lock loop), and when a Horizontal Synchronizing signal and an oscillation output are these frequencies, they will specifically be in a lock condition here.

[0005] On the other hand, when the image input Vi is the video signal of a PAL system or an SECAM system, in the 2nd synchronous detecting element 14, since a Horizontal Synchronizing signal and the oscillation output from the 2nd oscillator 15 are these frequencies, it will be in a lock condition, and "high (H)" will be outputted like the above. It is the same as that of the above to become "low (L)" in the condition of not locking. If an OR is taken at the OR (OR) gate 16 per each output of the synchronous detecting element 12 of the above 1st, and the 2nd synchronous detecting element 14, the output So will be set to "H" when there is one of image inputs Vi, and will be set to "L" at the time of a non-signal. Therefore, an output So serves as a signal (synchronous detecting signal) which shows the existence of a synchronizing signal. This output So is used for the latter power control circuit 17, at the time of "H", this monitoring device maintains a power-source ON state, and So turns OFF (standby condition) a power source at the

time of "L."

[0006]

**[Problem(s) to be Solved by the Invention]** Like the above-mentioned explanation, the circuit of the configuration of drawing 2 had detected the existence of an image input conventionally. however, a difference with so big horizontal frequency (15.734 KHz) of an NTSC system video signal and horizontal frequency (15.625 KHz) of a PAL system or an SECAM system -- the foil, the 1st oscillator 13, and the 2nd oscillator 15 -- as long as each was made into the thing of the above-mentioned frequency, the place which can be locked by the common synchronous detecting element, two synchronous detecting elements were used like drawing 2 , and there was room of rationalization of a circuit. This invention is made from such a background and aims at offering the synchronous detector which rationalized the conventional configuration ( drawing 2 ).

[0007]

**[Means for Solving the Problem]** In the De Dis plane monitor with which this invention made applicable to an input the 1st video signal with which horizontal frequency differs, and the 2nd video signal The horizontal synchronization separation section which separates a Horizontal Synchronizing signal from said input video signal, and the 1st oscillator which oscillates the signal of the same frequency as the Horizontal Synchronizing signal frequency of said 1st video signal, The 2nd oscillator which oscillates the signal of the same frequency as the Horizontal Synchronizing signal frequency of said 2nd video signal, The signal from the change-over circuit where said the 1st oscillator and 2nd oscillator are switched, and each said synchronizing separation section and change-over circuit At the time of said 1st video signal and the 1st oscillator signal Or the synchronous detecting element which outputs a synchronous detecting signal, respectively at the time of said 2nd video signal and the 2nd oscillator signal, When having detected the synchronous detecting-signal output by the output detecting element which detects the synchronous detecting-signal output from said synchronous detecting element, and said output detecting element, said change-over circuit is maintained in the present location. When this detection is no longer made, the synchronous detector which constituted said change-over circuit from a change-over control section switched to the oscillator side of another side from this present location is offered.

[0008]

**[Embodiment of the Invention]** The video signal of NTSC system, a PAL system, or an SECAM system is inputted into the horizontal synchronization separation section, and a Horizontal Synchronizing signal is separated. The said-separated Horizontal Synchronizing signal

is inputted into the synchronous detecting element of common use. This synchronous detecting element outputs the signal [for example, high (H)] which shows that it is in a synchronous condition, when the frequency and oscillator output frequency of a Horizontal Synchronizing signal are the same. The signal which shows that an output detecting element is in the above-mentioned synchronous condition outputted from a synchronous detecting element is detected. When there is this detection, a change-over control section maintains a change-over circuit in the present location, and when not detected, it switches to the oscillator side of another side from the present location. By this switch, a synchronous detecting element will output the same signal (H) as the above, if it will be in a synchronous condition, and if it is in an asynchronous condition, it will output the signal [for example, low (L)] which shows image the condition of not inputting (non-signal). Thereby, the existence of an input video signal is detected. Based on the time count of the timer section for becoming the above-mentioned non-signal, a change-over control section is switched until a synchronous condition is detected in a change-over circuit for every time amount defined beforehand.

[0009]

[Example] Hereafter, the synchronous detector by this invention is explained based on a drawing. Drawing 1 is the important section block diagram showing one example of the synchronous detector by this invention. In drawing, the horizontal synchronization separation section into which  $V_i$  separates the input video signal of NTSC system, a PAL system, or an SECAM system into, and 1 separates a Horizontal Synchronizing signal from the input video signal  $V_i$ , and 2 The frequency of the Horizontal Synchronizing signal from the horizontal synchronization separation section 1, When the frequency of an oscillator output is this frequency, it will be in a synchronous (lock) condition. The synchronous detecting element which outputs a predetermined signal, the 1st oscillator with which 3 oscillates the signal of the horizontal frequency (15.734 KHz) of an NTSC system video signal, and this frequency, The 2nd oscillator with which 4 oscillates the signal of the horizontal frequency (15.625 KHz) of the video signal of a PAL system or an SECAM system, and this frequency, The change-over circuit where 5 switches the output signal of the 1st oscillator 3, and the output signal of the 2nd oscillator 4 to the radical of control of the change-over control section 7, The output detecting element to which 6 detects the synchronous detecting-signal output from the synchronous detecting element 2, and 7 are based on the synchronous detection by the output detecting element 6. The timer section used for a time count for the change-over control section which makes change-over control of the change-over circuit 5, and 8 to switch a change-over circuit for every predetermined time at the time of no image inputting, and 9 are the power control sections controlled at power-source ON (operating state) or this OFF (standby condition) based on the output of the synchronous detecting element 2.

[0010] Next, actuation of this invention is explained. A video signal Vi is inputted into the horizontal synchronization separation section 1, and separates a Horizontal Synchronizing signal here. Although the Horizontal Synchronizing signal and oscillator output which were separated in the horizontal synchronization separation section 1 are inputted into the synchronous detecting element 2, when the frequency of the Horizontal Synchronizing signal and the frequency of an oscillator output are in agreement, the synchronous detecting element 1 will be in a lock condition, and will output the synchronous detecting signal So [for example, high (H)]. This synchronous detecting element 2 is constituted from a PLL circuit (phase lock loop), and when a Horizontal Synchronizing signal and an oscillator output are these frequencies, it will specifically be in a lock condition. Since this lock condition is materialized when a Horizontal Synchronizing signal frequency and the frequency of an oscillator output are in agreement, when there is an image input, it is always necessary to supply the oscillation signal of that Horizontal Synchronizing signal frequency and this frequency to said synchronous detecting element 2.

[0011] Therefore, the output detecting element 6 detects the above-mentioned lock condition based on the output of the synchronous detecting element 2. And when this detection is made, the change-over control section 7 maintains the change-over circuit 5 in the present location (it is a premise about for example, the 1st oscillator 3 side, the following, and this example). In addition, the input video signal Vi in this case is a signal of NTSC system. It was presupposed that it maintains in the above present location because the oscillator output needed in this change-over location was supplied to the synchronous detecting element 2. On the other hand, when a lock condition is no longer detected, the change-over control section 7 switches the change-over circuit 5 to the oscillator side (the 2nd oscillator 4 side) of another side from the present location. When the output detecting element 6 detects a lock condition in this condition, it is set as that location (the 2nd oscillator 4 side). The input video signal Vi in this case is a signal of a PAL system or an SECAM system. The synchronous detecting element 2 will be in the output state of the same synchronous detecting signal So as the above [high (H)] by the above. Based on the above output state [high (H)], the power control section 9 maintains the ON state of the power source of this equipment.

[0012] Even if it switches to the oscillator side (the 2nd oscillator 4 side) of above-mentioned another side, when a lock condition is not detected, a non-signal state without an image input is meant. In this case, in the synchronous detecting element 2, that output state So becomes high (H) to low (L) of the above-mentioned example for an asynchronous condition. Based on this low (L) condition, the power control section 9 turns off a power source so that this equipment may be changed into a standby condition. In addition, a standby condition is maintaining a power-source ON state and making it power-source OFF about others, such as PDP, except the block ( drawing 1 ) concerning this invention. When it becomes at the time of this non-signal state, the change-over control section 7 uses the timer section 8, switches the change-over circuit 5 to the 1st

oscillator 3 or 2nd oscillator 4 side for every fixed time amount, and supervises detection by the output detecting element 6. When a lock condition is again detected under this monitor, the change-over control section 7 sets the change-over circuit 5 to the said-detected oscillator side. By this lock condition detection, the power control section 9 turns on the power source of this equipment again from said standby condition, and makes it operating state. Hereafter, the above is repeated.

[0013]

**[Effect of the Invention]** As explained above, according to this invention, the synchronous detecting element which was using it the object for the video signals of NTSC system and for [ two ] the video signals of a PAL system and an SECAM system can be conventionally managed with one piece. Generally one expensive synchronous detecting element becomes reducible by this, and a circuit can be rationalized. And under this rationalized circuit, the former and this function to consider as a standby condition at the time of no video-signal inputting, and to make PDP into non-operating state can be attained, and the ephemeralization of useless power consumption and the life of PDP can be prevented.

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[Translation done.]